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A VERTICAL OIL-FIRED FURNACE FOR BRAZING "POBEDITE" DRILL BITS

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The process of brazing bits made of hard alloys into the heads of drills used in nonferrous metals mines is usually conducted in horizontal oil-fired furnaces.

The construction of a horizontal oil furnace, though generally efficient for heating hardened drills, does not always give satisfactory results under conditions of brazing pobedite drill bits.

The uniform filling of space between the bit and slot surfaces with solder may be achieved only with the drill in a vertical postion during the brazing process. Frequently the solder fails to fill in the gap between the bit base and the bottom of the slot -- a factor which is the most frequent cause of premature drill failure. Inserting a copper or brass plate under the base of the drill bit, as is practiced in some mines, has a negative effect on the sturdiness of the drill since the plate inevitably yields under influence of gradual upsetting of the thick lining layer of solder.

To improve the quality of pobedite drills and their sturdiness in drilling very hard ores, a vertical oil funace was constructed for the Tekeliy mine in 1942. This furnace is still in use at present.

Basic advantages of this furnace are as follows:

1. Vertical positions of the drill during brazing and good filling with molten solder of all spaces between the bit and drill slot.

2. Possibility of observing the brazing process and turning the drill during heating.

3. Cutting fuel consumption in half.

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4. High durability of the furnace lining; possibility of separate bricks falling out is eliminated.

5. Facility and rapidity of lining replacement.

6. Low cost and simplicity of manufacturing the furnace.

Employment of this furnace in the Tekeliy mine considerably reduced cases of hard alloy bits falling out during drilling operations, and also eliminated time lost on account of frequent repair of the roof lining of the horizontal furnace.

Due to the advantages of uniform heating and the possibility of stopping air intake after switching the furnace out, it is also used satisfactorily for cementation and annealing of various parts.

When brazing long drills, a pipe 2 meters long has to be installed under the furnace and a special clamp must be used for holding the drill in proper position during brazing.

Direct action of the flame on the drill head should be avoided in brazing. To accomplish this the flame must be diverted upward with a brick placed on edge in front of the fuel nozzle.

The 3-year experience of using the described furnace in the Tekeliy mine permits recommendation of this construction for other ore mines.

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